

Claims

1. A communication system (200) comprises one or more communication network supporting communications for
5 a plurality of communication units on a shared communication resource, wherein the communication network (200) is characterised by:
 - an identification function (144) for identifying interference within or non-availability of a portion of
10 the shared resource;
 - a resource-responsible agent (140), responsive to the identification function (144) identifying an interference within or non-availability of a portion of the shared resource; and
15 a communication adaptation function (142), responsive to the resource-responsible agent (140) in reducing a level of interference or making a portion of the shared resource available for use.
- 20 2. A communication system (200) according to Claim 1, wherein the one or more communication networks comprises a first network (210) generating interference that affects communications on a second network (220).
- 25 3. A communication system (200) according to Claim 2, wherein the communication networks (210, 220) are uncoordinated.
4. A communication system (200) according to Claim 2
30 or Claim 3, wherein the identification function (144) resides in a subscriber unit (100, 230) or a serving communication unit (222) on the second network (220).

5. A communication system (200) according to any of preceding Claims 2 to 4, wherein the communication adaptation function (142) resides in a subscriber unit (100, 232) or a serving communication unit (212) operating on the first network (210) such that the resource-responsible agent (140) is able to influence the communication of the subscriber unit (232) or the communication behaviour on the first communication network (210).

6. A communication system (200) (200) according to any of preceding Claim 2 to 5, wherein the communication system (200) (200) is further characterised by a reconciliation and mediation agent (202) operably coupled to the first network (210) and second network (220) for mediating therebetween.

7. A communication system (200) (200) according to Claim 6, wherein the reconciliation and mediation agent (202) reconciles interference that the first network (210) caused to the second network (220) and determines any countermeasures employed by either network.

8. A communication system (200) (200) according to any of preceding Claim 2 to 7, wherein the second network (220) suffering interference from the first network (210) initiates a procedure to detect the interference and inform the first network (210) of the interference.

9. A communication system (200) (200) according to Claim 1, wherein the one or more communication networks

is a single network, such that the communication adaptation function (142) is responsive to the resource-responsible agent (140) in reducing a level of interference or making a portion of the shared resource
5 available for use within the single network.

10. A communication unit (100) comprising a processor (108) operating on a shared communication resource, wherein the communication unit (100) is characterised in
10 that the processor (108) comprises:

a resource-responsible agent (140), responsive to an identification of interference within or non-availability of a portion of the shared communication resource; and

15 a communication adaptation function (142), responsive to the resource-responsible agent (140) in reducing a level of interference caused by the communication unit (100) or making a portion of the shared resource available for use by other communication
20 units.

11. A communication unit (100) according to Claim 10, wherein the communication unit is a wireless subscriber communication unit or a wireless serving communication
25 unit (212, 222).

12. A communication system (200) according to any of preceding Claims 1 to 9, or a communication unit (100) according to any of preceding Claims 10 or 11, wherein
30 the resource-responsible agent (140) is distributable to a number of communication units operating in the one or more networks (210, 220).

13. A communication system (200) according to Claim 12 or a communication unit (100) according to Claim 12, wherein the distribution and/or activation of the resource-responsible agent (140) is based on one or more of the following: location of an interference or communication unit (100), usage patterns that historically resulted in interference, exchange for receiving a reduced tariff for usage.

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14. A communication system (200) according to any of preceding Claims 1 to 9, 12 or 13 or a communication unit (100) according to any of preceding Claims 10 to 13, wherein the communication adaptation function (142) in response to the resource-responsible agent (140) restricts capabilities of an interfering communication unit (100) for certain classes of users.

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15. A communication system (200) according to any of preceding Claims 1 to 9 or 12 to 14 or a communication unit (100) according to any of preceding Claims 10 to 14, wherein the identification of interference within or non-availability of a portion of the shared communication resource is based on one or more of the following: a local measurement of interference, an interference measurement transmitted to a communication unit via the network or a serving communication unit, an interference measurement transmitted to a communication unit from another communication unit in a similar locality.

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16. A communication system (200) according to any of preceding Claims 1 to 9 or 12 to 15 or a communication

unit (100) according to any of preceding Claims 10 to 15,
wherein the communication adaptation function (142)
comprises one or more time-limited behaviour pattern(s)
(316), for example, a reduction in transmit power of a
5 subscriber communication unit or a network causing
interference, for, say, a random or fixed period of time.

17. A communication system (200) according to any of
preceding Claims 1 to 9 or 12 to 16 or a communication
10 unit (100) according to any of preceding Claims 10 to 16,
wherein the communication adaptation function (142)
automatically and/or autonomously adapts one or more
operational parameters of the communication unit (100) in
response to the resource-responsible agent (140).

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18. A communication system (200) according to any of
preceding Claims 1 to 9 or 12 to 17 or a communication
unit (100) according to any of preceding Claims 10 to 17,
wherein the communication adaptation function (142)
20 adapts one or more performance attributes of the
interfering wireless communication unit (100), for
example causing one or more of the following effects: a
less clear audio signal and/or video signal, break a
connection, fail to establish a connection, perform at a
25 reduced power level or limit a connection time, a
reduction in the wireless communication unit (100)'s
battery power, temporarily disabling the interfering
wireless communication unit (100), increasing a tariff,
or withholding service.

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19. A communication system (200) according to any of
preceding Claims 1 to 9 or 12 to 18 or a communication

unit (100) according to any of preceding Claims 10 to 18,
wherein a communication unit (100) having received a
resource-responsible agent (140) is able to remove an
effect of the resource-responsible agent (140) if the
5 communication unit (100) (100) performs one or more of
the following:

(i) Power-down upon sensing or being informed of
interference;

(ii) Switch to operating in an opportunity driven
10 multiple access mode;

(iii) Switch to using local short-range nodes to
obtain information;

(iv) Switch to using a fixed wire-line connection;

(v) Halts communications until it is operating
15 nearer to its serving wireless communication unit (100);
and/or

(vi) Effect a payment for the resource-
responsible agent (140) to be disabled.

20 20. A communication system (200) according to any of
preceding Claims 1 to 9 or 12 to 19 or a communication
unit (100) according to any of preceding Claims 10 to 19,
wherein an action taken by the communication adaptation
function (142) is based on its sensitivity to, or
25 prioritisation allocated to, one or more of the following
parameters:

(i) Location of the wireless communication unit
(100);

(ii) Frequency of operation of the wireless
30 communication unit;

(iii) Radio frequency transmit power of the
wireless subscriber communication unit;

- (iv) One or more services requested by the wireless subscriber communication unit;
- (v) Event correlations.

- 5 21. A reconciliation and mediation agent (202) characterised in that it is operably coupled to and mediates between at least two interfering uncoordinated networks (210, 220).
- 10 22. A reconciliation and mediation agent (202) according to Claim 21, wherein the reconciliation and mediation agent (202) is configured to reconcile an interference that a first network (210) causes to a
15 second network (220) and determines whether any countermeasures that either network has performed has reduced the interference.
23. A reconciliation and mediation agent (202) according to Claim 21 or Claim 22, wherein the
20 reconciliation and mediation agent (202) comprises, or is operably coupled to, a function that controls one or more of the following behaviours:
- 25 (i) An ability to report back behaviour and/or countermeasure behaviour employed by a communication unit (100);
- (ii) An ability to trace a progress of a resource-responsible agent (140) strain; and
- (iii) An ability for the communication unit (100) to time-stamp its activity.
- 30 24. A resource-responsible agent (140) that is distributable to a subscriber communication unit (100,

230, 232) or communication network (210, 220) to effect a modification of the wireless subscriber communication unit's or communication network's operational capabilities in response to a trigger related to potential interference or non-availability of a communication resource.

25. A communication unit (100) comprising a processor (108) to receive a resource-responsible agent (140) according to Claim 24 and modify one or more operational parameters of the communication unit (100) in response to determining that it is operating in a resource irresponsible manner.

26. A method (300) of sharing a communication resource in a communication system (200), the communication system (200) comprising one or more networks supporting communication for a plurality of communication units on the shared communication resource, the method comprising the step of:

identifying (302, 304, 306) an interference within or non-availability of a portion of the shared resource;

the method characterised by the steps of:

distributing and/or activating (308, 310) a resource-responsible agent (140) to reduce a level of interference or make a portion of the shared resource available for use in the communication system (200) in response to identifying an interference within or non-availability of a portion of the shared resource; and

adapting (316) one or more communication functions upon receipt of activation of the resource-responsible agent (140).

- 5 27. A method of sharing a communication resource in a communication system (200) according to Claim 26, wherein the one or more communication networks are uncoordinated and comprises at least a first network generating interference that affects communications on a second
10 network, wherein the method is further characterised by the step of:

mediating between the first network and the second network, for example based on any countermeasures employed by either network.

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28. A communication protocol configured to support the method of sharing a communication resource in a communication system (200) according to Claim 26 or 27.

- 20 29. A storage medium storing processor-implementable instructions for controlling a processor to carry out the method of Claim 26 or 27.

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